Comparative study on some oxyurids in egypt

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Parasitic diseases are one of the major obstacles in the growth and development of animal health. Oxyurids are of special public health importance.The present study deals with the study of oxyurids that infect man, wild and laboratory used rodents.The enteric pinworm Enterobius vermicularis is believed to be the commonest helminth parasite of man in temperate and well sanitized countries. The peculiar biology of Enterobius vermicularis contributes to the creation of -contamination foci around the infected resident that facilitates reinfection. The intra family and cohabitating members infection is very frequent: also the most important infection routes are through oral and respiratory tract as the oral infection includes the anus hand-mouth route, onychophagia and/or ingestion of contaminated food. The respiratory tract infection may result from inhaling dust contaminated with the parasite eggs.Syphacia obvelata, Syphacia muris and Aspiculuris tetraptera commonly infect wild and laboratory rodents at high prevalence even in well managed colonies.Parasite identification is essential for taxonomy, diagnosis and proper treatment. Identification of Syphacia spp. infecting rats or mice is done by examining male worms for the location of the mamelons, however male worms are rarely recovered during necropsy because they die after mating and females of S. muris and S. obvelata are difficult to differentiate, since they resemble each other and are reported to differ only in the location of the vulva being slightly posterior in S. muris to that of S. obvelata. These morphological differences are difficult to determine and are not very reliable, therefore differentiation between these species by the morphology is very difficult, if not impossible. This fact urged the need for easier and more reliable methods for the identification and differentiation between these pinworms.The present study is undertaken aiming to define the role of some wild and laboratory rodents as reservoirs for oxyurids. The study also seeks to investigate the degree of similarity between the encountered pinworms aiming to nominate the closely related species to Enterobius vermicularis as an experimental model.The present study deals with the study of Oxyurids that infect man, wild and laboratory used rodents so the study was undertaken aiming to complement and update the present knowledge of pinworms of some rodents in order to define the role of these animals as a reservoir for oxyurids. The study also seeks to investigate the degree of similarity between the encountered pinworms aiming to nominate the closely related species to Enterobius vermicularis as an experimental model.The study included the following:• Epidemiological survey on some wild rodents in some regions of Egypt including Nile rats, brown rats, black house rats, house mice, Cairo spiny mice,

greater gerbils, lesser gerbils, and lesser short tailed gerbils.• The epidemiological parameters include the study of the seasonal prevalence, intensity, and abundance of oxyurids in relation to host's sex, maturity and type species.• Taxonomical, morphological and morphometric stidies using light and scanning electron microscopy of the encountered species recovered from different wild and laboratory rodents.• Using light and scanning electron microscopy of the encountered pinworm species to complement and update the available knowledge on the taxonomy, morphology and morphometric data.• A simple molecular technique, RAPD-PCR using ten arbitrary primers is used to differentiate between the encountered pinworm species: Syphacia obvelata, Syphacia muris, Aspiculuris tetraptera and Entrobius vermicularis aiming to evaluate the possibility of using RAPD-PCR as a tool to differentiate between different pinworm species. The results will be mathematically and statistically evaluated to reveal the significant variations and to specify the degree of similarity and divergence between the encountered species aiming to nominate the closely similar species to Enterobius vermicularis as a laboratory model.In the present study 400 wild rodents of different species and sexes at different maturity stages were examined for oxyurids in the years 2008-2009. The study included the Nile rat (Arvicanthis niloticus), the brown rat (Rattus norvigicus), the black house rat (Rattus rattus), the house mouse (Mus musculus), the Cairo spiny mouse (Acomys cahirinus), the lesser short tailed gerbil (Dipodillus simoni), the greater gerbil (Gerbillus pyramidum), and the lesser gerbil (Gerbillus gerbillus), in addition to 47 laboratory white rats and white mice.The black house rats and house mice were infected with three pinworm species, S. obvelata at prevalence of 3.5% and 41.81%, S. muris at 38.59% and 25.45% and A. tetraptera at 10.52% and 1.75% respectively. The brown rat and lesser short tailed gerbils were infected with two species, S. obvelata at prevalence of 5% and 32.35% and S. muris at prevalence of 7.5% and 5.88% respectively. The Nile rat was infected only with S. muris at 5.12%.Cairo spiny mice, greater gerbils and lesser gerbils were free of pinworm infection.The present study is the first to record pinworm species from the lesser short tailed gerbil.The prevalence, mean intensity and mean abundance of each pinworm species in wild rodents were reported in relation to host sex, and maturity during various seasons.Results were analyzed statistically to define the significant differences between the reported results. Student t-test and analysis of variance ANOVA were used to reveal significances in intensities and abundances, while Fisher's Exact test and Chi-square test were used to detect differences in prevalence.Results were compared with previous reports in Egypt and other parts of the world. Variations between different host species, sex, maturity and seasons were interpreted and discussed.The richness of pinworm infection was well illustrated in rodents. The black house rat and house mouse were reported to harbor: S. obvelata and S. muris together, while the black house rat harbored S. muris with A. tetraptera simultaneously. Although the lesser short tailed gerbil and brown rat acted as hosts for S. obvelata and S. muris, yet only single infection with either species was reported.Morphometric data were analyzed using t- test, ANOVA one way and two ways ANOVA. The encountered species were photographed, drawn with camera Lucida and examined with a scanning electron microscope. The use of scanning electron microscopy in addition to light microscopy

added new structural cretaria that differentiate between the pinworms under study. These include the shape and surface structure of lips and labial papillae; the occurrence of cephalic vesicles in both S. obvelata and A. tetraptera but not in S. muris; the presence of cervical alae in males S. obvelata but not in females, in females S. muris but not in males and in both sexes of A. tetraptera; the presence of caudal alae in A. tetraptera and absent in Syphacia spp.; the number of transverse striae in mamelons varied in Syphacia spp.; the shape and form of vulva varied in the three encountered species. The structure of buccal cavity and oesophagous were confirmed and new cretaria were added. The number, shape and size of cloacal papillae in males were recorded. Variations in the shape of transverse cuticular annulations in both sexes of the three encountered species were discussed.Morphometric characteristics that displayed host induced -statistically significant variations should not be used in species differentiation.RAPD PCR (Random Amplified Polymorphic DNA-Polymerase Chain Reaction) with ten 1Kb random primers namely: OPB-03, OPB-06, OPB-19, OPC-02, OPC-05, OPC-14, OPD-03, OPD-13, OPE-07, and OPE-12 were used to differentiate and define the similarity coefficient between the encountered pinworm speciesOPC-02, OPC-14 and OPD-3 revealed higher similarity between E. vermicularis and A. tetraptera than with the other Syphacia species.Seven of the ten arbitrary primers (OPB-03, OPB-06, OPB-19, OPC-05, OPD-13, OPE-07, and OPE-12) used in the present study revealed that the similarity between A. tetraptera and E. vermecularis is higher (75%, 75%, 80%, 72.7%, 40%, 60%, and 66.7% respectively) than between Enterobius vermicularis and Syphacia species. The previous finding coincides with the accumulative result obtained from the ten arbitrary primers used by RAPD-PCR where the total dendrogram revealed two main clusters, the first nested E. vermicularis and A. tetraptera in a minor cluster at similarity coefficient of 61.7% together with S. muris.The present study concluded that A. tetraptera or S. muris can be used as an experimental models for enterobiasis.